Assignment 5 – Packet Generation Tools

1. Introduction

This assignment focuses on understanding and using packet generation tools such as Iperf and D-ITG inside a Mininet virtual network. These tools help generate traffic between hosts and evaluate network performance by measuring throughput, jitter, delay, packet loss, and other important parameters. Such tools are widely used in research and real-world network testing environments.

2. Tools Overview

Iperf: A widely used network testing tool capable of generating TCP and UDP traffic. It provides bandwidth measurements, data transfer rates, jitter, and loss statistics.

D-ITG (Distributed Internet Traffic Generator): A more advanced tool capable of generating custom packet flows with configurable rates, packet sizes, and protocols. It simulates realistic traffic patterns.

3. Installing Required Tools

Install the traffic generation tools using:

sudo apt-get update sudo apt-get install iperf\sudo apt-get install ditg

4. Running Traffic in Mininet

Start a simple Mininet topology with two hosts:
sudo mn --topo single,2

Start an Iperf server on host h1:
iperf -s

Start an Iperf client on host h2 to generate traffic toward h1:
iperf -c 10.0.0.1

Optional: Run D-ITG for customizable traffic generation:
ITGSend -a 10.0.0.1 -C 1000 -t 5000

5. Detailed Observations

During the experiment, observe the following parameters depending on the tool used:
• Bandwidth: Maximum achievable throughput between two hosts. **• Transfer Rate:** Volume of data transmitted over time. **• Jitter:** Variation in packet delay (important for real-time traffic). **• Packet Loss:** Number of packets lost during transmission. **• Delay:** Time taken by packets to travel from source to destination.

6. Learning Outcomes

• Gained hands-on experience with traffic-generation tools. • Learned how to measure and analyze basic network performance metrics. • Understood how tools like Iperf and D-ITG are used in real-world networking experiments.